

**Claims**

1. A method for marking a material, preferably a liquid, the method comprising the steps of:
  - a) identifying at least one ion comprised in the said material at a concentration level of below 50 ppm in the unmarked state;
  - b) selecting a marking composition comprising at least one ion as identified in step a), and preferably selecting a said ion from the groups of ions being comprised in standard sea water;
  - c) incorporating the marking composition of step b) into the said unmarked material;wherein the concentration level of the said at least one ion in the marked material is increased in step c) by at least the factor of 3, preferably of 5 and even more preferred of 8 as compared to the concentration level of the ion present in the unmarked material.
2. A method for marking and identifying the authenticity of material, preferably an aqueous or non-aqueous liquid, the method comprising the steps of:
  - a) identifying at least one ion comprised in the said material at a concentration level of below 50 ppm in the unmarked state;
  - b) selecting a marking composition comprising at least one ion as identified in step a), and preferably selecting a said ion from the group of ions being comprised in standard sea water;
  - c) incorporating the marking composition of step b) into the unmarked material, the altered concentration level of the at least one ion being defined as a reference value;

- d) measuring in the marked material the individual concentration of the said at least one ion by the means of a sensor; and
  - e) comparing the measured value with at least one reference value and indicating the result of the comparison;
- wherein the concentration level of the said at least one ion in the marked material is increased in step c) by at least the factor of 3, preferably of 5 and even more preferred of 8 as compared to the concentration level of the ion present in the unmarked material.
- 3. A method according to one or more of claims 1 or 2, wherein, prior to step a), the concentration level of at least one ion in the unmarked material is determined.
  - 4. A method according to one or more of claims 1 to 3, wherein said marking composition comprises at least one salt of the group comprising inorganic salts and organic salts.
  - 5. A method according to one or more of claims 1 to 2, wherein said ion is an inorganic anion.
  - 6. A method according to one or more of claims 1 to 5, wherein said ion is an anion selected from the group comprising fluoride, chloride, bromide, iodide, borate, carbonate, nitrate, phosphate, sulfate, and selenate.
  - 7. A method according to one or more of claims 1 to 6, wherein said ion is an inorganic cation.
  - 8. A method for marking a material according to claim 7, wherein said ion is a cation selected from the group comprising ammonium(+), lithium(+), sodium(+), potassium(+), rubidium(+),

cesium(+), magnesium(2+), calcium(2+), strontium(2+), barium(2+), iron (2+/3+), cobalt(2+), nickel(2+), copper(2+), and zinc(2+).

9. A method according to one or more of claims 1 to 8, characterised in that the material is an alcoholic beverage, a perfume, a cosmetic product, a drug or pharmaceutical ingredient.
10. A method of identifying the authenticity of a material, the material being marked according to a method according to one or more of claims 1 or 3 to 9, the method comprising the steps of:
  - a) providing reference values of at least one ion comprised in a marking composition which has been added to the material;
  - b) measuring by the means of a sensor an individual concentration of at least one ion in a material to be identified, the sensor being capable of measuring individual concentration values of the ionic compound; and
  - c) comparing the measured value with at least one reference value and indicating the result of the comparison.
11. The method of one or more of the claims 2 to 10, characterised in that the sensor is an electrochemical sensor, preferably an ion-selective electrode.
12. The method according to claim 11, characterised in that the ion selective electrode is a multi-ion-selective electrode.
13. The method according to one or more of claims 2 to 10, characterised in that the sensor is a ion-selective Field Effect Transistor.

14. The method according to one or more of claims 2 to 13, characterised in that the measuring step is performed as a field audit analysis.
15. The method according to one or more of claims 2 to 14, characterised in that the method further comprises the step of an off-the-field laboratory analysis for confirmation of a field audit analysis.
16. The method according to claim 15, characterised in that the off-the-field laboratory analysis is performed by analytical methods comprising atomic absorption spectroscopy (AAS), ion chromatography (IC), mass spectrometry (MS), or combinations thereof.
17. A marked material, preferably a marked foodstuff or drink, a marked pharmaceutical or a marked cosmetic product, obtained according to a method according to one or more of claims 1 or 3 to 10, characterised in that the concentration of the ions incorporated in the marked material, the said ions being comprised in said marking composition, is non-toxic with respect to human or animal use.